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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/718,676	11/24/2003	Taisuke Yamauchi	117855	1219

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EXAMINER	
QUARTERMAN, KEVIN J	
ART UNIT	PAPER NUMBER
2889	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/718,676	YAMAUCHI, TAISUKE	
	Examiner	Art Unit	
	KEVIN QUARTERMAN	2889	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 June 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-23* is/are pending in the application.

4a) Of the above claim(s) *12 and 13* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-11 and 14-23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *24 November 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Allowable Subject Matter

1. Applicant is advised that the Notice of Allowance mailed 26 July 2007 is vacated. If the issue fee has already been paid, applicant may request a refund or request that the fee be credited to a deposit account. However, applicant may wait until the application is either found allowable or held abandoned. If allowed, upon receipt of a new Notice of Allowance, applicant may request that the previously submitted issue fee be applied. If abandoned, applicant may request refund or credit to a specified Deposit Account.

2. The indicated allowability of claims 1-23 is withdrawn in view of the newly discovered reference(s) to Garbuzov. Rejections based on the newly cited reference(s) follow.

Election/Restrictions

3. Because the indicated allowability of claims 1-23 has been withdrawn, the restriction requirement as set forth in the Office action mailed on 11 January 2006 is hereby reinstated.

4. Claims 12-13 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on 10 February 2006.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1-11, 14-17, and 19-23 are rejected under 35 U.S.C. 102(b) as being anticipated by Garbuzov.

7. Regarding independent claim 1, Figure 4 of Garbuzov shows a self-emitting element comprising a light-emitting layer (Organic layers) that is disposed between electrodes (ITO, Top contact) and that emits light upon applying a voltage between the electrodes (Fig. 1); a protective layer (Planarization) that covers an emitting side of the light-emitting layer, forms an interface between the protective layer and an external medium, and has a thickness that allows the light emitted from the light-emitting layer to undergo total reflection at least once at the interface in an area of the light-emitting layer; a reflective layer (Metal) that covers an opposite side, as viewed from the light-emitting layer, of the protective layer; and an angle changer (inclined surface) that is disposed at a periphery of the light-emitting layer, and changes a direction of the light propagating in the protective layer so that the light is incident on the interface at less than a critical angle.

8. Regarding claim 2, Figure 4 of Garbuzov shows the reflective layer as one of the electrodes (Top contact).

9. Regarding claim 3, Figure 4 of Garbuzov shows the angle changer as a reflective surface that is inclined so that a space at the emitting side increases.

10. Regarding claim 4, Figure 4 of Garbuzov shows the angle changer as a refractive surface that is inclined so that a space at the emitting side decreases.

5. Regarding claim 5, Figure 4 of Garbuzov shows a bank that projects on the emitting side to separate the light-emitting layer from other light-emitting layer, wherein an inner surface of the bank is the angle changer, and the protective layer is formed in an area that is enclosed with the bank.

6. Regarding claim 6, Figure 4 of Garbuzov shows a bank that projects on the emitting side to separate the light-emitting layer from other light-emitting layer; and a protrusion (Planarization), made of an insulating material, that projects toward the emitting side from the bank, wherein an inner surface of the protrusion is the angle changer, and the protective layer is formed in an area that is enclosed with the protrusion.

7. Regarding claim 7, Figure 4 of Garbuzov shows the light-emitting layer as an organic electroluminescent layer (Organic layers).

8. Regarding independent claim 8, Figure 4 of Garbuzov shows a display panel comprising a plurality of light-emitting layers (Organic layers), each of the light-emitting layers being disposed between electrodes (ITO, Top contact), and emitting light upon applying a voltage between the electrodes (Fig. 1); a protective layer (Planarization) that covers an emitting side of the light-emitting layers, forms an interface between the protective layer and an external medium, and has a thickness that allows the light

emitted from the light-emitting layers to undergo total reflection at least once at the interface in an area of the corresponding light-emitting layer; a reflective layer (Metal) that covers an opposite side, as viewed from the light-emitting layers, of the protective layer; and a plurality of angle changers, each of the angle changer being disposed at a periphery of each of the light-emitting layers, that change direction of the light propagating in the protective layer so that the light is incident on the interface at less than a critical angle.

9. Regarding claim 9, Figure 4 of Garbuzov shows a plurality of banks, each of the banks projecting on the emitting side to separate the light-emitting layers from each other, each of inner surfaces of the bank being each of the angle changers, and the protective layer being formed in an area that is enclosed with the each of the banks.

10. Regarding claim 10, Figure 4 of Garbuzov shows a plurality of banks, each of the banks projecting on the emitting side to separate the light-emitting layers from each other; and a plurality of protrusions (Planarization), made of an insulating material, projecting toward the emitting side from the each of the banks, wherein each of inner surfaces of the protrusions is each of the angle changer, and the protective layer is formed in an area that is enclosed with each of the protrusions.

11. Regarding independent claim 11, Figure 4 of Garbuzov shows a display apparatus comprising a display panel including a plurality of light-emitting layers (Organic layers), each of the light-emitting layers being disposed between electrodes (ITO, Top contact) and emitting light upon applying a voltage between the electrodes (Fig. 1); a protective layer (Planarization) that covers an emitting side of the light-

emitting layers, forms an interface between the protective layer and an external medium, and has a thickness that allows the light emitted from the light-emitting layers to undergo total reflection at least once at the interface in an area of the corresponding light-emitting layer; a reflective layer (Metal) that covers an opposite side, as viewed from each of the light-emitting layers, of the protective layer; and a plurality of angle changers, each of the angle changer being disposed at a periphery of each of the light-emitting layers, that change direction of the light propagating in the protective layer so that the light is incident on the interface at less than a critical angle; and a drive unit (See Fig. 1) that drives the light-emitting layers of the display panel and displays an image.

12. Regarding independent claim 14, Figure 4 of Garbuzov shows a self-emitting element comprising a display layer that includes a light-emitting element (Organic layers); and an output layer that is transparent, is disposed in an emitting direction of the display layer, and includes an angle changer (Metal) that changes a direction of light output from the light-emitting element to a direction of the emitting side, wherein a refractive index of the output layer is either almost the same as or greater than a refractive index of the light-emitting element (pg. 396, col. 2).

13. Regarding claim 15, Figure 4 of Garbuzov shows the angle change as any one of a micro lens, a micro prism, and a micro mirror.

14. Regarding claim 16, Figure 4 of Garbuzov shows the display layer including a transparent electrode layer (ITO), and the transparent electrode layer has a refractive

index (ITO~1.96) greater than that of the light-emitting element (Alq_3~1.70) and sandwiches the light-emitting element.

15. Regarding claim 17, Figure 4 of Garbuzov shows an antireflective layer in an interface between the transparent electrode layer and the output layer.

16. Regarding independent claim 19, Figure 4 of Garbuzov shows a display panel comprising a plurality of self-emitting elements that are arranged two-dimensionally in a matrix form, wherein each of the self-emitting elements includes a display layer that includes a light-emitting element (Organic layers); and an output layer (TiO_2) that is transparent, is disposed in an emitting direction of the display layer, and includes an angle changer (Metal) that changes a direction of light output from the light-emitting element to a direction of the emitting side, wherein a refractive index of the output layer (TiO_2~2.7) is either almost the same as or greater than a refractive index of the light-emitting element (pg. 396, col. 2).

17. Regarding independent claim 20, Figure 4 of Garbuzov shows a display apparatus comprising a display panel comprising a plurality of self-emitting elements that are arranged two-dimensionally in a matrix form, wherein each of the self-emitting elements includes a display layer that includes a light-emitting element (Organic layers); and an output layer that is transparent, is disposed in an emitting direction of the display layer, and includes an angle changer (Metal) that changes a direction of light output from the light-emitting element to a direction of the emitting side, wherein a refractive index of the output layer (TiO_2~2.7) is either almost the same as or greater than a

refractive index of the light-emitting element (Alq_3~1.7); and a drive unit (Fig. 1) that drives the display layer of the display panel and displays an image.

18. Regarding independent claim 21, Figure 4 of Garbuzov shows a self-emitting element comprising a light-emitting layer (Organic layers) that is disposed between electrodes (ITO, Top contact) and that emits light upon applying a voltage between the electrodes; a protective layer (Planarization) that covers an emitting side of the light-emitting layer, forms an interface between the protective layer and an external medium, and has a thickness that allows the light emitted from the light-emitting layer to undergo total reflection at least once at the interface in an area of the corresponding light-emitting layer; a reflective layer (Metal) that covers an opposite side, as viewed from the light-emitting layer, of the protective layer; and an angle changer that is disposed at a periphery of the light-emitting layer, and changes a direction of the light propagating in the protective layer so that the light is incident on the interface at less than a critical angle, wherein a refractive index of the protective layer (polyimide~1.5) is either almost the same as or greater than a refractive index of the light-emitting layer (Alq_3~1.7, pg. 396, col. 2) .

19. Regarding independent claim 22, Figure 4 of Garbuzov shows a self-emitting element comprising a display layer that includes a light-emitting element (Organic layers); and an output layer that is transparent, is disposed in an emitting direction of the display layer, and includes an angle changer that changes a direction of light output from the light-emitting element to a direction of the emitting side, wherein the angle changer is a micro lens (Fig. 1); and a refractive index of the output layer (TiO_2~2.7) is

either almost the same as or greater than a refractive index of the light-emitting element (Alq_3~1.7, pg. 396, col. 2) .

20. Regarding independent claim 23, Figure 4 of Garbuzov shows a self-emitting element comprising a display layer that includes a light-emitting element (Organic layers); and an output layer that is transparent, is disposed in an emitting direction of the display layer, and includes an angle changer that changes a direction of light output from the light-emitting element to a direction of the emitting side, wherein the angle changer is a micro prism which changes the direction of the light by refraction; and a refractive index of the output layer (TiO_2~2.7) is either almost the same as or greater than a refractive index of the light-emitting element (Alq_3~1.7, pg. 396, col. 2).

Claim Rejections - 35 USC § 103

21. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

22. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Garbuzov in view of Seo (US 2002/0093283).

23. Garbuzov teaches each of the limitations of independent claim 14, as discussed earlier. Figure 4 of Garbuzov also shows a sealing layer that is transparent, and is disposed in an emitting direction of the output layer. However, Garbuzov fails to

exemplify an inert gas that has a refractive index of almost one being filled between the output layer and the sealing layer.

24. Seo teaches, in Figure 11B, that is known in the art to provide a self-emitting element with an inert gas (¶ [0142]) that has a refractive index of almost one being filled between the output layer (906) and the sealing layer (1106). Seo discloses that this arrangement is provided for completely sealing the organic luminescent element in an airtight space (¶ [0142]).

25. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the device of Garbuzov with an inert gas that has a refractive index of almost one being filled between the output layer and the sealing layer, as taught by Seo, for completely sealing the organic luminescent element in an airtight space.

Conclusion

26. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Minano (US 2003/0016539) discloses high efficiency non-imaging optics. Kiyomoto (US 2002/0085390) discloses optical device. Thibeault (US 6,657,236) discloses an enhanced light extraction in LEDs through the use of internal and external optical elements. Krames (US 6,229,160) discloses light extraction from semiconductor light-emitting device via chip shaping.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KEVIN QUARTERMAN whose telephone number is (571)272-2461. The examiner can normally be reached on M-TH (7-5:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Minh-Toan Ton can be reached on (571) 272-2303. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Kevin Quarterman
Examiner
Art Unit 2889

kq
15 February 2008

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